Report of the Peer Review of the NIH Commons
April 10, 2000

A peer review group comprising members of the extramural community, NIH institutes and centers (IC), the Department of Health and Human Services (DHHS), and other federal agencies was charged with assessing the NIH Commons. Toward this end, the reviewers were asked to comment on six questions that addressed goals, development prioritization, deployment schedules, integration, and resource allocation. The reviewers' comments, issues, and recommendations are summarized below. Feedback from the review will be incorporated into immediate management decisions and long-term planning.

Question 1: Are the goals for the NIH Commons appropriate in light of current trends in electronic research administration (ERA) and especially given the recent enactment of the Government Paperwork Elimination Act (P.L.105-277) and the Federal Financial Assistance Management Improvement Act (P.L. 106-107)?

>**Comments:** The design of the NIH Commons has formed a basis for a trans-government EGA (Electronic Grants Administration) initiative, the Federal Commons. This similarity will ensure that the NIH Commons will be compatible with and integrate well the Federal Commons, now mentioned as the common EGA face of the government in recently passed legislation. DHHS is committed to meeting the target date of May 2001 cited in the legislation for having a common electronic application process in place. With the early success of interagency Edison and CRISP on the Web, DHHS considers NIH to be "the shining example" of how government should be moving forward. Considering the NIH Commons as part of the Federal Commons focuses its development on interagency collaboration and assures responsiveness to the legislation and all stakeholders. NIH is looking to work with other agencies to lay the groundwork for developing a model for EGA.

>**Issues:** The biggest concern regarding the legislation is whether NIH can meet the mandated deadline and perform internal reengineering of required value-added processes. The current deployment schedule matches the dates in the legislation, including the May 2001 target date. At the existing resource level, however, that deadline will not be attained. The legislation, P.L. 106-107, could provide the opportunity for DHHS to ask Congress for more money to avoid what will amount to an unfunded mandate. Regardless of whether additional funds are provided by Congress to facilitate integration of the NIH Commons into the Federal Commons, OMB will not tolerate agencies that do not comply with the law.

>There is a concern about the current level of funding for the NIH Commons, as well as NIH's method of centralized funding of complex computing systems. This is resulting in a lack of assurance that a level of funding for the NIH Commons can be maintained commensurate with NIH's leadership role in the federal EGA initiatives.

>**Recommendations:**
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>> ➢ The goals for the NIH Commons are appropriate in light of the legislative mandate and NIH's leadership in developing the Federal Commons.

- ➢ NIH should continue to develop and implement the Commons, although more resources will be needed for NIH to be able to comply with P.L. 106-107.

- ➢ NIH must find a way to resolve the funding problem so work can progress sufficiently to meet mandated deadlines.

- ➢ NIH must establish a clear set of priorities with its constituencies and do a better job of linking the extramural community to the design process and to the Federal Commons.

- ➢ An external advisory group should be created to counsel NIH on the design of and prioritization for the NIH Commons.

Question 2: NIH proposes to support ERA (NIH Commons and IMPAC II) on an open registration basis to all grantee organizations within one to two years. Given the level of resources described in the Commons Deployment Plan, does it appear that adequate human and fiscal resources have been projected to accommodate the approximately 2,000 grantee organizations that submit approximately 40,000 applications a year?

Comments: The National Science Foundation (NSF) FastLane (electronic receipt and review of grant applications) system is a viable benchmark for NIH because it is more analogous to the NIH Commons than any other existing system. Comparing the budgets for contract costs and hardware, NSF budgeted $3.5 million in FY 2000 and $13 million from FY 1994 to FY 2000, whereas the NIH Commons allocated only $1.1 million in FY 2000 and $8 million from FY 1995 to FY 2000.

Further, whereas NSF handles approximately 30,000 applications per year, 8,000 of which are funded, NIH receives 45,000+ applications per year, with approximately 38,000 new and continuing research grant awards funded. Such numbers do provide perspective. However, the NSF application figures are not a perfect benchmark because of the complexity and range of funding mechanisms involved for NIH awards: NSF applications are roughly equivalent to an NIH Exploratory/Developmental Grant (R21), which is less complex than NIH's standard grant, the R01. Further, NIH supports a wide range of other awards, some of which are highly complex, including clinical trials, program projects, and centers.

The IT infrastructure needed to support this magnitude of electronic traffic represents another key issue for which plans must be made. NSF has found that approximately 80 percent of electronic applications are received in the last four hours before an application deadline, causing a crunch in resources. While NIH has done some planning for sizing of the NIH Commons, additional detailed studies must be done to optimize network and server configuration.

As with funding, resources for staffing are low for NIH Commons. FastLane is staffed by 28 people -- seven in the development branch, 15 contractors, and six help desk staff -- who handle about 2,500 calls per month. In contrast, NIH has 10 people working on the Commons, which includes two people overseeing all user inquiries. NIH is expected to need more FTEs than does NSF to handle NIH Commons support functions, in expectation of the order of magnitude of use of the Commons relative to NSF's FastLane.

Issues: Compared to FastLane, resources for the NIH Commons are meager. NIH will need to allocate proportionally at least as much money and staff to the NIH Commons as NSF has allotted to FastLane.

Internally, NIH is not prepared for electronic applications. Pilot studies for electronic grants submission are needed to show the impact on NIH Institutes and Centers (ICs), including application routing, scanning, and interface with IMPAC II, the NIH grants records enterprise database. ICs must be prepared, and the technology must be in order during times of peak volume. Staffing issues also need to be addressed. That is, the duties of staff who now work in receipt of paper applications will be changing commensurate with receipt of electronic applications. In general, such changes are likely to go from routine manual jobs, e.g. mail room-related activities, to somewhat more technically sophisticated jobs, e.g. date entry and tracking of electronic applications.

Recommendations:

➢ Based on the NSF experience, the NIH Commons lacks sufficient resources. NIH will need proportionally more funds and FTEs to handle the volume generated by the NIH Commons.

➢ More detailed benchmarking needs to be done to determine an appropriate funding level for NIH's ERA effort.

➢ The ERA project team should prepare a plan that shows what can and cannot be achieved with available funds and what resources are needed to meet mandated deadlines.

➢ Additional staff and funds will be needed to deploy the NIH Commons modules and handle support functions.

➢ NIH must assure that its infrastructure is adequate to handle the spike in the volume of transactions that occurs in the final hours before receipt deadlines, including verifying the adequacy of servers, hardware, software, Internet service, and customer service.

➢ NIH must prepare internally for electronic applications with pilot studies for electronic grants submission, including application routing, scanning, routing within an IC, and interface with the ERA system.

➢ NIH should plan to retrain various staff to support receipt of electronic applications.

➢ To address an issue of fairness, NIH must establish receipt deadlines to take into account time zone differences.

Question 3: Does the design of the NIH Commons, which affords grantee organizations options for formatting information for transmission to NIH, appear consistent with early adoption by grantee organizations? Do the technological options lend themselves to integration between the grantee organization's information technology systems and the NIH Commons?

Comments: The technological options afforded by the NIH Commons design is appreciated by the diverse grantee organization community. Receipt of datastreams directly between the grantee database and the NIH Commons appears preferable for initial dataset transmission, such as for competing applications. By contrast, Web interfaces may be more appropriate for progress reports or other items that involve the processing of information already in the NIH ERA system. However, NIH should ensure flexibility in designing and implementing technologies because the needs of larger and smaller schools differ. Whereas, EDI datastream technology is often the preferred option for larger schools, smaller institutions or businesses may need technologies requiring less user programming and infrastructure, such as PDF or HTML. Still on the horizon, XML will be an attractive option. This alternative, at the current time however, is viewed as still premature, since tools are not yet available to either create or view XML file types. The NIH and grantee community should not wait until such tools are widely available. NIH should plan to incorporate XML in future design, development and testing as a further alternative to EDI and HTML.

The NIH should redouble its efforts to implement a datastream version for receipt of competitive grant applications in the short-term. Key grantee organizations are prepared and anxiously await the time when datastreams can be submitted. Efforts should also be put forward to further standardize implementation conventions for grants being submitted to DHHS agencies. Grantee institutions are finding it difficult to accommodate different agency implementations of similar business processes.

Issues: Large and small institutions have different technology needs for data exchange.

Recommendations:
- ➢ NIH should aggressively pursue EDI-formatted datastream submission of the competitive grant application using the 194 data set.
- ➢ NIH should also test HTML datastream implementations as soon as possible and explore other technologies, such as PDF and XML, as appropriate.
- ➢ NIH should continue to assist the community with different formats, e.g, EDI, HTML, as well as consider PDF and XML. NIH should work to provide assistance; implementation convention documents, APIs and advice to grantee organizations working with datastreams..

Question 4: Given the deployment schedule described in the ERA status report, are the deployment priorities attributed to each of the Commons subsystems appropriate? Is a controlled deployment preferable for implementation to "drop dead" dates?

Comments: More conference calls and meetings with the community are needed to create a dialogue for setting priorities. NIH has emphasized developing e-SNAP because noncompeting continuations are a large portion of the annual NIH staff workload. e-SNAP also provides a good test of data integration from the Commons into IMPAC II. This is key because only when data integration is accomplished will the ICs see the benefits of IMPAC II.

For the grantee organizations' offices of sponsored research, however, noncompeting continuations are a low priority compared to changes that streamline their processes. For example, some offices of sponsored research would like PIs to be able to submit progress reports directly to the NIH awarding IC without having to go through a full routing for approval to all cognizant cost centers at the institution. Changes in this business process could provide the flexibility for each institution to determine whether or not the PI submits the report directly to NIH or with some degree of institutional approval.

Should NIH agree to proceed with the reengineering of the SNAP business process, plans must be made and NIH staff must be trained for optimal integration of such processes into ICs' business practices. Changes will need to be made in IMPAC II interfaces to route information electronically so ICs do not revert to paper processes.

The grantee organization community indicated that they support a phased approach to deployment. It allows them to introduce change to investigators and administrative staff with greater acceptance. It also gives them the opportunity to have input in system enhancements, and introduce change into long- and short-term goals.

Issues: Because the Commons is not yet integrated with IMPAC II, the NIH community does not see value in supporting the Commons. NIH business processes have not been redesigned to take full advantage of receipt and processing of electronic applications, and paper is still needed. For ICs to change their perspective and behavior, data integration must occur, and paper-based systems phased out. This will mean revamping operations within ICs and integrating data from the Commons into IMPAC II.

NIH policy changes will also need to take place, for example, to allow direct submission of progress reports to the Commons without requiring approval by the institution. NIH can work with the community to identify areas and design features that should be targeted first.

Recommendations:
- A Commons advisory group is needed to counsel NIH on the design and prioritization of Commons deployment activities.
- The e-SNAP pilot should continue with the 15 participating institutions while business processes are reengineered, resources examined, and integration with IMPAC II resolved. The pilot should not expand until these issues are addressed. However, because of its importance, the pilot should be emphasized at the cost of other parts of the deployment.
- NIH must ensure the integration of X-Train and e-SNAP data as tests for data integration, which will build support for the Commons among the ICs.
- NIH should change policy to accommodate client needs, for example, to allow direct submission by the PI of progress reports to the NIH.
- Further, the system must enable the PI to submit key forms, exchanging data directly with NIH.

- NIH should create a plan to show how it will 1) change business practices to migrate to electronic systems, 2) integrate data from the Commons into IMPAC II, and 3) communicate changes within NIH and to the outside community.

- In terms of the deployment schedule, the community likes a phased deployment but prefers target dates that give them the leverage to pursue resources at their institutions.

- NIH must do a better job of alerting the community to changes in priority.

- NIH should hold meetings with the private sector to discuss needs and potential involvement. Private sector companies should be encouraged to review and integrate NIH API standards in order to build systems to interact directly, via datastreams, with the NIH Commons.

- Increased resources are needed for user help and to gather better user group feedback throughout pilot deployments..

- NIH must do a better job of articulating what it is doing with available resources. NIH should provide the community with definite goals for the next six months, more general goals for the next year, and longer-range goals for five to six years.

Question 5: Do the costs detailed in the spreadsheet appear to be appropriate in comparison to systems of similar magnitude employing similar technologies?

Comments: Though there are not enough data for a true comparison, indications are that support levels are not appropriate. The NIH Commons is resource poor when compared to NSF's FastLane. Testing costs also seem very low. Industry standards indicate that testing should be approximately 40 percent of development costs, which is significantly higher than resources have allowed for the NIH Commons.

Issues: Issues raised about resources were similar to those under Question 2.

Recommendations:
- To adequately address this question, a more thorough comparison of the NSF and NIH systems should be done to assess whether the systems are comparable.

- A better understanding of interagency arrangements that could support ERA would be helpful. NIH should leverage relationships with other agencies that have been established through the Federal Commons initiative to determine areas they may want to support through shared resources.

Question 6: ERA is designed to support the flow of information necessary for the entire grants life cycle. Integral to this concept is the seamless integration of the NIH Commons and IMPAC II. Are appropriate resources, as described in the ERA Management Plan and Commons Deployment Plan, being devoted to ensure this?

Comment: Seamless integration of the Commons with IMPAC II is critical to the success of NIH's ERA initiative.

Issues: There is concern that until the NIH ERA system is fully integrated, it will not be possible to know if the respective aspects of the ERA system, the Commons and IMPAC II, can handle the receipt and processing of incoming data.

Better communication is needed for plans and integration efforts both internally and externally to NIH.

Until the NIH community sees a positive effect on its work processes, it will be difficult to develop interest and support for the NIH Commons.

Recommendations

➤ The integration of IMPAC II and the NIH Commons should be the first priority so X-Train and e-SNAP can be piloted.

➤ X-Train should be put into production as soon as possible to enable ICs to see how data is integrated from the Commons, highlighting the potential benefits of the system.

➤ NIH should examine how information received electronically is used internally to ensure that electronic data are not simply printed to maintain the same old paper-based systems.

Summary of Action Items

➤ Maintain an active role in the Federal Commons initiative to ensure NIH's leadership position in the design, development and deployment of systems that will respond to legislative mandates.

➤ Create an advisory group to counsel NIH on the NIH Commons design and priorities.

➤ Resolve the problem of insufficient funding. Show what can and cannot be achieved with available funds and what is needed to meet mandated deadlines. Perform benchmarking to determine an appropriate funding level.

➤ Make integration of IMPAC II and the NIH Commons a top priority so X-Train and e-SNAP can be piloted.

➤ Continue the e-SNAP pilot. Ensure business processes are reengineered, resources examined, and integration with IMPAC II resolved. Do not expand the pilot until these issues are addressed.

➤ Ensure integration of X-Train and e-SNAP data as tests for ERA system integration.

➤ Put X-Train into production as soon as possible.

➤ Have the NIH ERA project team prepare a realistic plan for resources.

➤ Aggressively pursue receipt of the competitive grant application via an EDI datastream format; support distribution of implementation conventions, APIs and advise to the community on datastream technology.

➤ Use other technologies, such as PDF and HTML, for smaller organizations, and explore new technologies, such as XML, as appropriate.

➤ Create a plan showing how NIH will migrate to electronic applications, integrate data from the Commons into IMPAC II, and communicate changes within NIH and to the outside community.

➤ Examine how information received electronically is processed internally to ensure migration from paper-based systems. Prepare ICs for electronic applications with pilot studies, including routing within ICs and interface with IMPAC II.

➤ Maintain a phased deployment schedule with specific target dates. Calibrate the dimensions of deployment based on the availability of adequate resources; provide the community with short- medium-, and long-term goals that address such calibration. Do a better job of alerting the community to changes in priority.

➤ Continue to encourage the private sector to discuss needs and potential involvement, and use the APIs that NIH has developed so companies can build systems to interact with NIH Commons.

➤ Change policy to accommodate the needs of the clients, e.g, submission of progress reports to the NIH directly by the PI.

➤ Do a better job of articulating what NIH is doing with available resources.

➤ Establish relationships with other agencies to determine their interests and areas they may want to support through shared resources.

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